ALBERTA ECONOMIC MULTIPLIERS

2006

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Alberta Economic Multipliers 2006

PREFACE

This publication presents economic multipliers, intensity ratios and supply ratios for the Alberta economy calculated using the 2006 Alberta Finance and Enterprise Input-Output Model. Information is provided for both the open (direct and indirect impacts) and closed (direct, indirect and induced impacts) forms of the model. Economic impacts are presented for the Alberta economy only.

The tables used in this publication are derived from the 2006 interprovincial Input-Output tables released by Statistics Canada in November, 2009.

Custom Impact Analyses

In addition to this publication, Alberta Finance and Enterprise maintains a highly disaggregated Input-Output Model for 2006 at the link level which covers 302 industries and 727 commodities. The model may be used to simulate directly both open and closed impacts where additional precision or more detailed output is required than is presented in this publication. The Alberta input-output model industry and commodity structure can also be customized to client specifications to make it more descriptive of changing economic conditions.

The I/O Model also has a Tax Module that provides impacts on Federal, Provincial and Local Tax Revenues. We have added Full Time Equivalents (FTE's) to the I/O Model this year, so running the model gives number of jobs required as well as FTE's for a given impact.

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Alberta Economic Multipliers 2006

TABLE OF CONTENTS

Introduction 1
Description of Economic Mulipliers 2
The Open and Closed Model 3
Producer and Purchaser Prices 4
Uses and Limitations of Multipliers 5
Description of Economic Multiplier Tables 6
An Example of Using Multipliers (Open Model) 9

TABLES

Open Model

Table 1: Alberta Industry Intensity Ratios 13
Table 2: Alberta Industry Multipliers 14
Table 3: Alberta Commodity Intensitiy Ratios in Producer Prices 15
Table 4: Alberta Commodity Intensitiy Ratios in Purchaser Prices 16

Closed Model

Table 5: Alberta Industry Intensity Ratios 17
Table 6: Alberta Industry Multipliers 18
Table 7: Alberta Commodity Intensitiy Ratios in Producer Prices 19
Table 8: Alberta Commodity Intensitiy Ratios in Purchaser Prices 20

Commodity Supply Ratios

Table 9: Alberta Commodity Supply Ratios 21

Appendices

Appendix 1Indusry Aggregation Parmeters 22
Appendix 2Indusry Codes at the Worksheet (W)
Level in Terms of 1997 NAICS 23

Alberta Economic Multipliers 2006

INTRODUCTION

Estimates of Alberta Gross Domestic Product (GDP) found in the income and expenditure accounts of the Alberta Economic Accounts provide Estimates of Alberta Gross Domestic Product (GDP) found in the income and expenditure accounts of the Alberta Economic Accounts provide unduplicated measures of economic production. They are "unduplicated" because GDP measures the value of final transactions only, with all inter-business purchases and sales associated with intermediate production cancelled out.

For example, the value of a good or service sold by industry A to industry B, and then used in industry B's production process for sale into final demand, is not directly recorded in GDP. Industry A's output is not counted directly because it is implicitly included in the value of output of industry B when it is sold into final demand. If the output of industry A were counted when it is sold as an intermediate good or service, the value of this output would be double counted - once when it was sold as an intermediate input to industry B, and again as part of the value of the output of Industry B when it sells its output into final demand. To avoid this problem, goods or services are valued only at the point where they are sold into final demand (i.e., to households for consumption, to business for investment, or to government for current or capital expenditure) or when they are exported.

A by-product of measuring GDP in this fashion is that the record of such intermediate transactions is lost and, as a result, extremely useful information concerning the economic linkages between industries is not revealed. The input-output accounts bring back into record these inter-industry flows of good and services, detailing gross output of commodities by producing industries, industry use of such commodities and primary inputs, and the final consumption and investment of commodities plus any direct purchases of primary inputs for final demand.

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DESCRIPTION OF ECONOMIC MULTIPLIERS

The most common components of the input-output model are economic multipliers which include commodity and industry intensity ratios as well as industry multipliers. The concept of a multiplier is a fairly simple one to understand. For example, an increase in demand for a commodity will produce three effects which are described by economic multipliers. The first is the impact on industries (firms) which expand production to satisfy increased demand. These effects are termed the **direct impacts**. Secondly, there is a ripple effect as these firms purchase additional required inputs from other firms. These effects are termed the indirect impacts. Lastly, as firms expand production, they also hire more staff and pay out wages thereby increasing the income received by employees. Households, after withdrawing a certain portion for taxes and savings, spend this income which in turn increases demand for other commodities. These impacts are termed **induced effects.**

Economic multipliers presented in this report are expressed in two forms: as industry multipliers and as intensity ratios for industries and commodities.

Industry multipliers are calculated by taking the total impact observed for a change in an economic variable and dividing it by the direct change. For example, if adding 100 jobs (the direct change) to an industry's workforce resulted in a total increase of 180 jobs (the total change) in the economy overall, the industry employment multiplier would be 1.8.

Industry multipliers are presented in ratio form and cannot be less than one since the direct impact is included in both the numerator and denominator. **Users are cautioned that they must know the direct impact on GDP at basic prices, labour income, or person years of employment before they can use this type of multiplier.**

Intensity ratios for commodities and industries are calculated by dividing the total economic impact by the change in consumption or output that led to the change. For example, if an industry increases its output by $5.0 million and this leads to an increase of $4.0 million in Alberta GDP, the intensity ratio would be 0.80 (that is 4.0/5.0). Intensity ratios are particularly useful for users because they are applied to gross output or expenditure, unlike absolute multipliers which have to be applied to the direct change. This is the type of "multiplier" that most users should use since they generally know the direct change in revenue or expenditure, but don't know the direct change in GDP that they are interested in analyzing.

There are two main kinds of multipliers. The first are called "open" multipliers which reflect only direct and indirect effects, and are derived from the open model. The second type of multipliers are called "closed" multipliers and include induced impacts as well as direct and indirect effects. These multipliers are derived from the closed model.

Alberta Economic Multipliers 2006

THE OPEN AND CLOSED MODEL

The Alberta Finance and Enterprise Input-Output Model (open version) provides estimates of direct and indirect economic impacts. Results based on the Alberta open model are virtually identical to those provided by the Statistics Canada interregional input-output model since both models are based on Statistics Canada input-output tables.

There are two significant difference between the Statistics Canada model and the Alberta Finance and Enterprise Model. While both models provide estimates of direct and indirect production, the Alberta Finance and Enterprise Model also provides estimates of induced economic impacts when the model is closed to households. The second is that the Statistics Canada model provides inter-provincial impact, while the Alberta Finance and Enterprise model provides impacts for Alberta only.

For the closed version of the Alberta input-output model, the household sector is treated as a production sector. The input of the household sector is consumer expenditure on goods and services, while output is labour income (consisting of wages and salaries, supplementary labour income, and net income of unincorporated business). It is assumed that households, after withdrawing a portion of their income for savings and taxes, spend the rest of their income on consumer goods and services. Closing an input-output model to households increases the interdependence of the system and results in a higher impact on the variables of the model leading to multipliers of a larger magnitude than those based on the open version.

The impacts of closing the system to households are referred to as induced effects.

The closed model has been criticized because it introduces a bias in favor of those economic projects with a higher labour content. For example, consider the case where two projects have the identical purchased inputs and the same level of direct GDP, but where one project has a higher proportion of labour income and the other a higher proportion of other operating surplus (e.g., corporate profits). For this case, the closed model will estimate a larger economic impact for the project with the higher proportion of labour income (other things being equal). This result occurs because the model has been "closed" to household spending but not to profits and the induced impacts estimated by the model are related to the level of household income rather than profits.

Results from both the open and closed (to households) models are presented in this publication. This approach allows users to use both versions for the purposes of analysis and to judge for themselves where the inclusion of induced impacts is warranted or advisable.

Commodity intensity ratios are presented in both producer and purchaser prices. Data that are measured in producer prices reflect the price received directly by the producer of the commodity. For example, this corresponds to the "farm gate" price in agriculture or the price received directly by a producing establishment in manufacturing.

Data in purchaser prices reflect the price paid by the final users of the good. This price, in addition to price received by the producer of the commodity, reflects other costs such as the price of transportation from the producer to the final seller, wholesale and retail mark-ups, and commodity indirect taxes.

These other costs which are added to producer prices to derive purchaser prices are referred to as margins. The model treats these margins as if they were purchased directly by the purchaser of the final good. For example, if a consumer purchases a television set from a retail outlet in Alberta, the model would treat the transaction as if the consumer had purchased separately the retail and wholesale mark-ups, the transportation costs from the producer to the seller, indirect taxes, and the actual price of the television set received by the producer.

Uses

Economic multipliers based on input-output models are a very useful tool in the decision making process, but users should be aware of their limitations. Firstly, input-output models (and the multipliers derived from these models) are static and not subject to the limits of production capacity. Secondly, these models reflect industry averages for technology use and average input costs. For these and other reasons, an input-output model will not provide a totally complete or absolute measure of the impact of economic change.

The most common use for multipliers is to estimate the economic impact associated with the establishment of a new firm; or the expansion, contraction or closure of existing firms. In these cases, it is preferable to use economic multipliers for relative rather than absolute comparisons due to the limitations of input-output models. For example, while economic multiplier analysis may be used to determine which activity has the largest economic impact, it should not be used to estimate the absolute impact of any single activity. Where multipliers are used to estimate the impacts of a single activity, the results should be treated as general estimates only and not as absolute values.

For example, if there is an increased demand for a commodity, the Alberta input-output model (and the multipliers included in this report) assume that:

- production increases can be met with no change in capacity (e.g., the construction of new plants);
- Alberta industries are able to maintain a fixed share of the market for the commodity with the remainder imported from outside the province; and
- increased output in Alberta occurs at industry average production costs using 2006 technology.

Limitations

It is unlikely that any of these assumptions would hold fully in the real world. In all likelihood, there would be some change in market share for Alberta industries and the marginal costs associated with increased output may be greater or less than average costs depending on the level of capacity utilization. In addition, significant changes in technology may have occurred for some industries since 2006.

When using the employment multipliers, **users are cautioned that these multpliers show the total number of jobs that are required to support the change in activity being considered. The I/O model cannot distinguish between full-time jobs and part-time jobs.** However, if one wants to know the number of FTE's required for an impact, running the Alberta I/O Model should be considered as this is now part of the output of the model. When the economy is running at full employment, **users are cautioned to remember that the number of jobs required for a particular project must come from other projects/industries or from outside the province. The I/O model does not indicate new jobs created – only the number of jobs required to support a given level of economic activity.** As indicated above, the I/O model assumes unlimited capacity, whereas in reality, there are a limited number of people in the workforce.

Some of these limitations may be overcome by using an updated industry input structure based on more current data, and subjecting this revised information to a computer simulation using the input-output model developed by Alberta Finance and Enterprise. If users wish to exercise this option they should contact Alberta Finance and Enterprise directly.

Alberta Economic Multipliers 2006

DESCRIPTION OF ECONOMIC MULTIPLIER TABLES

In this publication, economic multipliers are presented for gross domestic product (at basic prices), labour income, employment and gross production. Below is a brief description of each of the tables contained in this report and how they should be used. Tables 1 to 4 present results from the open model, while tables 5-8 present results from the closed model. Table 9 presents commodity supply ratios for Alberta.

TABLE 1: **OPEN MODEL**

Industry Intensity Ratios

Table 1 presents multipliers for the direct and indirect effects on the Alberta economy due to a change in output for each of 59 major industies. The results are in the form of intensity ratios and measure the effects on the Alberta economy in terms of GDP at basic prices, labour income, employment and gross production. The impacts on GDP, labour income and gross production are expressed as impacts per dollar of output change while employment impacts are expressed as the number of jobs per $10,000 of output (both in 2006 and 2009 dollars).

Example:

If there was a $1 million increase in the output of the construction industry (industry no. 230) in 2009, the effects would be as follows:

- GDP at basic prices would rise by 0.671 * $1,000,000 = $671,000.
- Total labour income would increase by 0.493 * $1,000,000 = $493,000.
- Employment would grow by $1,000,000/$10,000 * 0.059 = 5.9 jobs (based on the second column of employment intensity ratios).
- Gross Production would rise by 1.583 * $1,000,000 = $1,583,000.

TABLE 2: **OPEN MODEL**

Industry Multipliers

Table 2 consists of multipliers (direct and indirect) for industries. **To use these multipliers, the user must know the direct increase in GDP at basic prices, labour income, and person years of employment for which the economic impacts are being analyzed.**

- To use the GDP multiplier, the direct GDP content associated with some change in output must be known or calculated. The components of direct GDP are those items which make up a firm's operating surplus (wages, profits, depreciation, etc.). The GDP multiplier is applied to this value.
- To use the labour income multiplier, the direct increase in wages, supplementary labour income and net income of unincorporated business must be known or estimated. The labour income multiplier is then applied to this value.

- The employment multiplier is expressed in terms of total persons years of employment per direct job. For example, if a firm in construction (industry no. 230) was established and in 2009 employed 100 people directly, it would create of total of 100 * 1.734 = 174.3 jobs (i.e., 100 direct jobs plus an additional 74.3 indirect jobs). Please note that the model cannot distinguish between full-time and part-time jobs.
- The gross production multiplier is expressed in terms of total gross production per dollar of direct production. For this multiplier, the direct production equals the total expenditure or output of the project.

It must remembered that the change in output of a firm is not what constitutes its direct contribution for labour income, employment, or GDP. This means that the multipliers corresponding to these items are not applied to the change in output for an industry. The only exception is the multiplier for gross production (column 5) which is applied to this quantity.

TABLE 3: **OPEN MODEL**

Commodity Intensity Ratios –Producer Prices

Table 3 presents multipliers for the direct and indirect effects on the Alberta economy due to a change in expenditure (purchase) for each of 43 commodities. The results are in the form of intensity ratios and measure the effects on the Alberta economy in terms GDP at basic prices, labour income and employment. The impacts on GDP and labour income are expressed as impacts per dollar of expenditure change while employment impacts are expressed as the number of jobs per $10,000 purchased (both in 2006 and 2009 dollars). Table 3 presents results calculated for data that is in producer prices.

Example:

If Alberta demand for Non-Metallic Mineral Products (commodity 25) increased by $10 million during 2009, the economic effects for GDP at basic prices and for labour income would as follows:

- GDP at basic prices would rise by 0.932 * $10,000,000 = $9,320,000.
- Total labour income would increase by 0.452 * $10,000,000 = $4,520,000.
- Employment multipliers are presented for commodities purchased at both 2006 and 2009 prices, and are used somewhat differently. The first column of employment multipliers is scaled in units of $10,000 purchased in 2006 dollars. The second column which expresses employment per $10,000 in 2009 dollars can be used to estimate employment impacts for production taking place in the year 2009. For this column, multipliers have been adjusted to reflect average price changes from 2006 to 2009. In this case, the calculation would be ($10,000,000/10,000) * 0.062 = 62.0 jobs.

TABLE 4: **OPEN MODEL**

Commodity Intensity Ratios –Purchaser Prices

Table 4 is analogous to Table 3 except that it presents results for data in purchaser prices.

TABLE 5: **CLOSED MODEL**

Industry Intensity Ratios

Table 5 is analogous to Table 1 except that it presents results for the closed model and includes induced impacts in addition to the direct and indirect effects.

TABLE 6: **CLOSED MODEL**

Industry Multipliers

Table 6 is analogous to Table 2 except that it presents results for the closed model and includes induced impacts in addition to the direct and indirect effects.

TABLE 7: **CLOSED MODEL**

Commodity Intensity Ratios at Producer Prices

Table 7 is analogous to Table 3 except that it presents results for the closed model and includes induced impacts in addition to the direct and indirect effects.

TABLE 8: **CLOSED MODEL**

Commodity Intensity Ratios at Purchaser Prices

Table 8 is analogous to Table 4 except that it presents results for the closed model and includes induced impacts in addition to the direct and indirect effects.

TABLE 9:

Commodity Supply Ratios –Producer Prices

Table 9 shows the source of supply for commodities purchased in Alberta. The data is presented as a percent for Alberta, the rest of Canada, and the rest of world. This table indicates both the extent of "openness" of the Alberta economy and the degree to which the economy depends on imports. For example, 69.5 percent of forestry products (commodity 3) purchased in Alberta was supplied from Alberta domestic production, 30.2 percent was imported from the rest of Canada, and 0.3 percent was imported from outside Canada.

Alberta Economic Multipliers 2006

AN EXAMPLE OF USING MULTIPLIERS (OPEN MODEL)

This example shows how multipliers and intensity ratios are used. Which you choose and how they are used is dependent upon the information you have available. For the purposes of this example, the results are presented for the open model only. The same calculations can be done using the appropriate closed model tables. For this example, the goal is to analyze which of two projects will provide a greater economic impact on the Alberta economy. The following information is given:

PROJECT 1:

Construction of an establishment in the Wood Manufacturing Industries

The plant (establishment) will cost $4 million to build in 2009. A further $1 million will be spent purchasing machinery and equipment. When in operation in 2010, the plant will provide 15 jobs and generate annual sales of $3 million with the following distribution of costs (all data are in producer prices):

	($000's)
Wages	$ 600
Profits	425
Depreciation	340
Overhead	35
Materials	1,600
Total Output (Sales)	**$ 3,000**

PROJECT 2:

Expansion of output by an establishment in the Wholesale Trade Industry

This project expands production by $3 million (in producer prices) in 2009 and 2010.

Analysis of Project 1

To analyze the impact of project 1, it is necessary to divide the project into two phases. The first phase occurs in 2009 and involves the effects of constructing the plant and purchasing the machinery and equipment. The second phase is the economic impacts of the yearly output of the plant beginning in 2010.

Construction Phase of Project 1:

To measure the impact of the construction phase, refer to Table 3 which presents commodity intensity ratios. Since project 1 involves the construction of a plant to manufacture wood products, the appropriate intensity ratios are those for commodity 30 (non-residential construction). The commodity table is used because the activity would be completed in Alberta by contractors whose output (or commodity) is construction.

The construction phase during 2009 would have the following effects:

- GDP at basic prices would increase by 0.684 * $4,000,000 = $2,736,000.
- Labour income would increase by 0.505 * $4,000,000 = $2,020,000.
- Employment would rise by $4,000,000/$10,000 * 0.057 = 22.8 jobs (based on the column scaled in 2009 dollars).

The impacts of purchasing the machinery and equipment in 2009 are also estimated by using intensity ratios from Table 3, specifically the ratios for commodity 22 (machinery and equipment). Since Alberta manufactures only a portion of the machinery or equipment it uses, it has a small impact on Alberta GDP (in this case only 29.7 percent of the machinery & equipment used in Alberta is produced in the province - see Table 9). The calculated impacts due to machinery and equipment purchases are as follows:

- GDP at basic prices would grow by 0.777 * $1,000,000 = $777,000.
- Labour income would rise by 0.390 * $1,000,000 = $390,000.
- Employment would increase by $1,000,000/$10,000 * 0.047 = 4.7 jobs (based on the column scaled in 2009 dollars).

Alberta clearly derives more economic benefit from the construction activity associated with Project 1 than it does from the purchase of machinery and equipment. This is due to the higher Alberta content for construction (i.e., local labour and materials) compared to machinery and equipment which is predominately produced outside the province.

Operations Phase of Project 1:

The second phase of impacts associated with Project 1 involves the actual operation of the plant which would begin operations in 2010. For this phase the industry based tables are used since the impacts associated with the economic activity of a particular industry are being analyzed. Since both the value of direct output and a breakdown of inputs has been given, either industry intensity ratios (Table 1) or industry multipliers (Table 2) can be used. To use Table 1, the procedure is to locate the appropriate industry and apply the ratios to the value of output. Here, information for industry no. 321 (wood product industries) is used yielding the following impacts:

- GDP at basic prices would grow by 0.688 * $3,000,000 = $2,064,000.
- Labour Income would increase by 0.410 * $3,000,000 = $1,230,000.
- Employment for 2009 would increase by $3,000,000/$10,000 * 0.054 = 16.2 jobs (based the 2009 industry employment intensity ratio).

The effects of price increases should be accounted for when determining employment impacts beyond 2009 for which employment intensity ratios are provided in Table 1. For example, if industry selling prices for wood product manufactures (or some other suitable proxy for inflation) increased by 3 percent during 2010, the industry employment intensity ratio would be adjusted as follows:

- Estimated employment multiplier for 2010 = 0.054/1.03 = 0.052.

Using this revised employment multiplier, growth in employment for 2010 would be estimated at 3,000,000/10,000 * 0.052 = 15.6 jobs.

Since detailed cost information has been provided, the industry multipliers provided in Table 2 can also be used. The first step is to analyze the categories for which cost information has been provided and identify which of these enter into the establishment's operating surplus and thereby directly into GDP at basic prices.

As a rule, wages, profits and depreciation are primary inputs (not purchased from another industry) and go directly into GDP. If overhead consists of rent payments and salaries for administration (as is assumed in this case), this category also enters directly into GDP. Materials and other purchased inputs do not since they are purchased from other industries and involve indirect economic impacts.

Therefore, the cost categories can be allocated as follows:

Wages	$ 600	Direct GDP
Profit	420	Direct GDP
Depreciation	340	Direct GDP
Overhead	35	Direct GDP
Subtotal	***1,400***	***Direct GDP***
Materials	1,600	Indirect GDP
Total Costs (Inputs)	***$ 3,000***	***Gross Output***

Thus, $1,400,000 out of the firm's $3 million gross output (total costs) constitutes its direct contribution to GDP at basic prices.

Included in this contribution is an estimated $600 of direct labour income and 15 direct jobs to which the appropriate multipliers from Table 2 (industry no. 321, wood product mannufacturing) would be applied. Based on Table 2, the indirect effects are:

- 1.833 * $1,400,000 = $2,566,200 of growth in GDP at basic prices.
- 1.741 * $600,000 = $1,044,600 of labour income.
- 1.853 * 15.0 direct jobs = 27.8 total jobs.

In this example, the results using multipliers from Table 2 are almost identical to those calculated using the intensity ratios from Table 1. In practice, the multipliers from Table 2 should be used in preference to the intensity ratios from Table 1. Intensity ratios assume an "average" direct contribution to labour income, GDP at basic prices, and employment, and these factors can vary substantially from industry averages for particular firms. Generally, a more accurate result can be obtained by using actual data for firms and industry multipliers rather than the industry averages implied in the intensity ratios.

Analysis of Project 2

The only information provided for project 2 is that output will increase by $3 million in both 2009 and 2010 for an establishment in the wholesale trade industry. Since only industry data has been given, one of the industry tables must be used (Table 1 or 2). As there is no breakdown of costs provided, direct GDP content associated with the change in output cannot be calculated. Therefore, industry intensity ratios from Table 1 rather than the multipliers from Table 2 must be used.

For Table 1 the wholesale trade industry is number 410. The $3 million change in the value of output is applied to each intensity ratio yielding the following total impacts:

- 0.840 * $3,000,000 = $2,520,000 growth in GDP at basic prices.
- 0.519 * $3,000,000 = $1,557,000 growth in labour income.
- $3,000,000/$10,000 * .073 = 21.9 jobs required.

Since the change in output of $3 million is the same for 2009 and 2010, the labour income and GDP impacts would be the same for both years

To calculate the 2010 employment impact it is necessary to allow for price increases over 2009. For example, if the industry selling price (or another appropriate price proxy) for the wholesale trade industry increased by 3 percent in 2010, the employment multiplier (scaled in 2009 dollars) could be adjusted as follows:

- 0.073/1.03 = 0.071.

Therefore, the employment impact in 2010 would be:

- $3,000,000/$10,000 * 0.071 = 21.3 jobs.

Comparison of the Two Projects

The last step in the analysis is to compare the results of the two projects. The following is a summary of the results (note that for Project 1, we have to add the impacts of the construction and machinery & equipment purchases to get total impact for 2009):

	PROJECT 1	2
GDP at Basic prices ($000's)		
2009	3,513	2,520
2010	2,064	2,520
Labour Income ($000's)		
2009	2,410	1,557
2010	1,230	1,557
Employment (Jobs)		
2009	27.5	21.9
2010	16.2	21.3

It is clear that project 1 has the larger economic impact for 2009. This result is largely due to the construction phase of the plant. If a longer term view is taken, then project 2 may in fact yield the larger economic benefit. This can be seen by comparing impacts for 2010 for which project 2 has a greater effect on GDP, labour income and employment.

It must be remembered that when the economy is in a phase of full employment, an increase in resources in one project may draw resources from other industries, reducing the overall impact.

TABLE 1: ALBERTA INDUSTRY INTENSITY RATIOS

(Open Model – Direct and Indirect Impacts)

Industry		GDP at Basic Prices	Labour Income	Employment 2006	Employment 2009	Gross Output
11A	Crop and animal production	0.749	0.236	0.100	0.087	2.094
113	Forestry and logging	0.715	0.389	0.053	0.050	1.581
114	Fishing, hunting and trapping	0.743	0.620	0.210	0.182	1.310
115	Support activities for agriculture and forestry	0.786	0.551	0.133	0.121	1.470
211	Oil and gas extraction	0.899	0.183	0.020	0.017	1.282
212	Mining (except oil and gas extraction)	0.841	0.314	0.035	0.030	1.372
213	Support activities for mining and oil and gas extraction	0.780	0.537	0.060	0.052	1.352
22A	Electric power generation, transmission and distribution	0.866	0.208	0.022	0.019	1.329
22B	Natural gas distribution, water, sewage and other systems	1.153	0.291	0.041	0.035	1.642
230	Construction	0.671	0.493	0.070	0.059	1.583
311	Food manufacturing	0.571	0.272	0.074	0.068	2.071
312	Beverage and tobacco product manufacturing	0.604	0.271	0.039	0.038	1.463
31A	Textile and textile product mills	0.621	0.426	0.084	0.073	1.322
315	Clothing manufacturing	0.578	0.520	0.124	0.107	1.210
316	Leather and allied product manufacturing	0.673	0.319	0.156	0.149	1.340
321	Wood product manufacturing	0.688	0.410	0.061	0.054	1.665
322	Paper manufacturing	0.601	0.314	0.039	0.036	1.503
323	Printing and related support activities	0.650	0.420	0.062	0.054	1.332
324	Petroleum and coal products manufacturing	0.828	0.192	0.022	0.019	2.118
325	Chemical manufacturing	0.716	0.250	0.032	0.028	2.103
326	Plastics and rubber products manufacturing	0.604	0.374	0.058	0.056	1.631
327	Non-metallic mineral product manufacturing	0.758	0.364	0.054	0.049	1.573
331	Primary metal manufacturing	0.318	0.175	0.025	0.022	1.295
332	Fabricated metal products manufacturing	0.608	0.415	0.058	0.054	1.297
333	Machinery manufacturing	0.566	0.336	0.042	0.040	1.316
334	Computer and electronic product manufacturing	0.369	0.315	0.042	0.040	1.358
335	Electrical equipment, appliance and component manufacturing	0.525	0.450	0.074	0.072	1.279
336	Transportation equipment manufacturing	0.509	0.394	0.054	0.046	1.287
337	Furniture and related product manufacturing	0.633	0.490	0.079	0.069	1.431
339	Miscellaneous manufacturing	0.686	0.446	0.096	0.087	1.314
410	Wholesale trade	0.840	0.519	0.082	0.073	1.442
4A0	Retail trade	0.859	0.618	0.161	0.144	1.416
484	Truck transportation	0.824	0.569	0.087	0.079	1.519
485	Transit and ground passenger transportation	0.993	0.732	0.156	0.128	1.592
486	Pipeline transportation	0.938	0.227	0.026	0.022	1.218
48A	Air, Rail, Water & Scenic & Sightseeing Transportation & Support Activities for Transportation	0.764	0.459	0.067	0.059	1.561
49A	Postal service and couriers and messengers	0.854	0.674	0.139	0.128	1.458
493	Warehousing and storage	0.912	0.692	0.118	0.101	1.195
512	Motion picture and sound recording industries	0.748	0.285	0.061	0.053	1.340
513	Broadcasting and telecommunications	0.847	0.300	0.044	0.036	1.225
51A	Publishing industries, information services and data processing services	0.845	0.464	0.073	0.064	1.285
5A0	Finance, insurance, real estate and rental and leasing	0.878	0.436	0.048	0.043	1.391
541	Professional, scientific and technical services	0.823	0.629	0.101	0.089	1.380
561	Administrative and support services	0.852	0.694	0.152	0.133	1.329
562	Waste management and remediation services	0.930	0.324	0.051	0.044	1.269
610	Educational services	0.928	0.771	0.270	0.235	1.334
620	Health care and social assistance	0.876	0.639	0.124	0.103	1.233
710	Arts, entertainment and recreation	0.770	0.556	0.208	0.177	1.470
720	Accommodation and food services	0.724	0.493	0.159	0.131	1.454
811	Repair and maintenance	0.852	0.608	0.160	0.131	1.400
813	Grant-making, civic, and professional and similar organizations	0.848	0.715	0.159	0.136	1.324
81A	Personal and laundry services and private households	0.867	0.636	0.282	0.249	1.248
NP1	Non-profit institutions serving households (excluding education)	0.859	0.720	0.176	0.148	1.357
NP2	Non-profit education services	0.858	0.753	0.162	0.137	1.232
GS1	Hospitals and government nursing and residential care facilities	0.831	0.717	0.127	0.106	1.216
GS2	Universities and government education services	0.923	0.810	0.128	0.113	1.201
GS4	Other municipal government services	0.878	0.583	0.094	0.077	1.339
GS5	Other provincial and territorial government services	0.784	0.568	0.101	0.085	1.772
GS6	Other federal government services	0.795	0.655	0.095	0.081	1.366

Notes: Intensity ratios for GDP, Labour Income and Gross Output expressed as total impact per dollar of output change
Intensity ratios for employment expressed as total number of jobs required per $10,000 of output change

TABLE 2: ALBERTA INDUSTRY MULTIPLIERS

(Open Model – Direct and Indirect Impacts)

Industry		GDP at Basic Prices	Labour Income	Employment 2006	Employment 2009	Gross Output
11A	Crop and animal production	2.701	6.299	1.892	1.903	2.094
113	Forestry and logging	1.639	1.690	1.924	1.886	1.581
114	Fishing, hunting and trapping	1.286	1.209	1.094	1.096	1.310
115	Support activities for agriculture and forestry	1.444	1.301	1.200	1.191	1.470
211	Oil and gas extraction	1.224	2.079	2.924	3.023	1.282
212	Mining (except oil and gas extraction)	1.306	1.444	1.720	1.780	1.372
213	Support activities for mining and oil and gas extraction	1.306	1.216	1.353	1.361	1.352
22A	Electric power generation, transmission and distribution	1.312	1.554	1.858	1.894	1.329
22B	Natural gas distribution, water, sewage and other systems	1.528	2.081	2.110	2.141	1.642
230	Construction	1.831	1.664	1.667	1.734	1.583
311	Food manufacturing	2.791	2.267	3.449	3.055	2.071
312	Beverage and tobacco product manufacturing	1.576	1.921	2.235	2.075	1.463
31A	Textile and textile product mills	1.350	1.263	1.228	1.232	1.322
315	Clothing manufacturing	1.258	1.157	1.117	1.120	1.210
316	Leather and allied product manufacturing	1.287	1.376	1.120	1.112	1.340
321	Wood product manufacturing	1.833	1.741	1.830	1.853	1.665
322	Paper manufacturing	1.684	1.648	2.014	1.935	1.503
323	Printing and related support activities	1.358	1.297	1.337	1.349	1.332
324	Petroleum and coal products manufacturing	12.940	8.162	9.697	8.968	2.118
325	Chemical manufacturing	4.295	3.560	4.918	4.563	2.103
326	Plastics and rubber products manufacturing	1.709	1.471	1.454	1.407	1.631
327	Non-metallic mineral product manufacturing	1.693	1.607	1.667	1.625	1.573
331	Primary metal manufacturing	1.758	1.794	1.975	2.025	1.295
332	Fabricated metal products manufacturing	1.330	1.276	1.318	1.304	1.297
333	Machinery manufacturing	1.377	1.370	1.481	1.443	1.316
334	Computer and electronic product manufacturing	2.105	1.691	2.013	1.885	1.358
335	Electrical equipment, appliance and component manufacturing	1.412	1.280	1.283	1.251	1.279
336	Transportation equipment manufacturing	1.394	1.303	1.383	1.396	1.287
337	Furniture and related product manufacturing	1.516	1.347	1.372	1.378	1.431
339	Miscellaneous manufacturing	1.312	1.272	1.201	1.198	1.314
410	Wholesale trade	1.420	1.379	1.449	1.442	1.442
4A0	Retail trade	1.377	1.273	1.171	1.169	1.416
484	Truck transportation	1.468	1.339	1.365	1.357	1.519
485	Transit and ground passenger transportation	1.454	1.279	1.227	1.244	1.592
486	Pipeline transportation	1.159	1.436	1.682	1.698	1.218
48A	Air, Rail, Water & Scenic & Sightseeing Transportation & Support Activities for Transportation	1.594	1.486	1.603	1.596	1.561
49A	Postal service and couriers and messengers	1.410	1.288	1.253	1.242	1.458
493	Warehousing and storage	1.142	1.105	1.104	1.107	1.195
512	Motion picture and sound recording industries	1.357	1.570	1.463	1.467	1.340
513	Broadcasting and telecommunications	1.181	1.326	1.416	1.451	1.225
51A	Publishing industries, information services and data processing services	1.244	1.262	1.298	1.294	1.285
5A0	Finance, insurance, real estate and rental and leasing	1.331	1.441	1.915	1.880	1.391
541	Professional, scientific and technical services	1.362	1.282	1.314	1.314	1.380
561	Administrative and support services	1.284	1.186	1.150	1.150	1.329
562	Waste management and remediation services	1.180	1.314	1.404	1.405	1.269
610	Educational services	1.278	1.147	1.069	1.068	1.334
620	Health care and social assistance	1.184	1.133	1.124	1.132	1.233
710	Arts, entertainment and recreation	1.527	1.412	1.204	1.209	1.470
720	Accommodation and food services	1.450	1.331	1.178	1.193	1.454
811	Repair and maintenance	1.361	1.256	1.162	1.175	1.400
813	Grant-making, civic, and professional and similar organizations	1.284	1.187	1.161	1.165	1.324
81A	Personal and laundry services and private households	1.196	1.143	1.055	1.055	1.248
NP1	Non-profit institutions serving households (excluding education)	1.331	1.170	1.121	1.125	1.357
NP2	Non-profit education services	1.196	1.090	1.072	1.074	1.232
GS1	Hospitals and government nursing and residential care facilities	1.176	1.125	1.139	1.143	1.216
GS2	Universities and government education services	1.144	1.090	1.119	1.113	1.201
GS4	Other municipal government services	1.289	1.233	1.273	1.292	1.339
GS5	Other provincial and territorial government services	2.696	2.696	3.119	3.125	1.772
GS6	Other federal government services	1.358	1.266	1.357	1.362	1.366

Notes: Multipliers for GDP expressed as total impact per direct change in GDP
Multipliers for Labour Income expressed as total impact per direct change in Labour Income
Multipliers for Gross Output expressed as total impact per direct change in Gross Output
Multipliers for Employment expressed as total jobs required per direct job required

You must know the direct change in GDP at basic prices, labour income or number of direct jobs required before using these multipliers.

TABLE 3: ALBERTA COMMODITY INTENSITY RATIOS IN PRODUCER PRICES

(Open Model – Direct and Indirect Impacts)

Commodity		GDP at Basic Prices	Labour Income	Employment 2006	Employment 2009	Gross Output
1	Grains	1.282	0.296	0.117	0.102	3.011
2	Other agricultural products	0.822	0.302	0.117	0.102	2.291
3	Forestry products	0.839	0.451	0.062	0.058	1.849
4	Fish and seafood and hunting and trapping products	1.010	0.598	0.182	0.158	1.869
5	Metal ores and concentrates	0.906	0.334	0.040	0.033	1.347
6	Mineral fuels	1.085	0.222	0.025	0.021	1.549
7	Non-metallic minerals	1.232	0.444	0.055	0.047	2.078
8	Services incidental to mining	0.780	0.536	0.060	0.052	1.353
9	Meat, fish and dairy products	0.643	0.331	0.101	0.093	2.722
10	Fruit, vegetable and other food products and feeds	0.835	0.353	0.067	0.065	1.989
11	Soft drinks and alcoholic beverages	0.875	0.512	0.143	0.122	1.879
12	Tobacco and tobacco products	0.000	0.000	0.000	0.000	0.000
13	Leather, rubber, and plastic products	0.766	0.465	0.073	0.069	2.052
14	Textile products	0.938	0.498	0.098	0.086	2.527
15	Hosiery, clothing and accessories	0.734	0.686	0.130	0.114	1.637
16	Lumber and wood products	1.275	0.764	0.116	0.103	3.047
17	Furniture, mattresses and lamps	0.743	0.603	0.093	0.083	1.745
18	Wood pulp, paper and paper products	0.808	0.424	0.053	0.049	2.017
19	Printing and publishing	0.839	0.457	0.073	0.067	1.430
20	Primary metal products	0.446	0.264	0.036	0.032	1.585
21	Fabricated metal products	0.751	0.500	0.068	0.063	1.635
22	Machinery	0.913	0.459	0.058	0.055	1.904
23	Motor vehicles, other transportation equipment and parts	0.691	0.520	0.074	0.065	1.676
24	Electrical, electronic and communication products	0.424	0.388	0.058	0.055	1.565
25	Non-metallic mineral products	0.974	0.472	0.070	0.064	2.035
26	Petroleum and coal products	1.468	0.326	0.037	0.032	3.125
27	Chemicals, pharmaceuticals and chemical products	0.923	0.319	0.042	0.038	2.704
28	Miscellaneous manufactured products	0.872	0.541	0.092	0.086	1.800
29	Residential building construction	0.609	0.436	0.067	0.059	1.488
30	Non-residential construction	0.684	0.505	0.069	0.057	1.630
31	Repair construction	0.751	0.582	0.093	0.080	1.477
32	Transportation and storage	0.838	0.490	0.078	0.069	1.478
33	Communications services	0.878	0.383	0.063	0.055	1.307
34	Other utilities	0.929	0.280	0.037	0.031	1.410
35	Wholesaling margins	0.832	0.512	0.081	0.072	1.444
36	Retailing margins and services	0.857	0.610	0.158	0.140	1.414
38	Finance, insurance, and real estate services	0.854	0.477	0.069	0.062	1.517
39	Business and computer services	0.844	0.606	0.100	0.088	1.403
40	Private education services	0.889	0.747	0.166	0.145	1.296
41	Health care and social assistance services	0.870	0.655	0.128	0.106	1.258
42	Accommodation services and meals	0.726	0.493	0.160	0.133	1.466
43	Miscellaneous services	0.832	0.552	0.147	0.127	1.424
47	Non-market services provided by non-profit institutions serving households	0.863	0.727	0.179	0.150	1.335
48	Non-market government sector services	0.840	0.665	0.110	0.094	1.436

Notes: Intensity ratios for GDP, Labour Income and Gross Output expressed as total impact per dollar of output change
Intensity ratios for employment expressed as total number of jobs required per $10,000 of output change

TABLE 4: ALBERTA COMMODITY INTENSITY RATIOS IN PURCHASER PRICES

(Open Model – Direct and Indirect Impacts)

Commodity		GDP at Basic Prices	Labour Income	Employment 2006	Employment 2009	Gross Output
1	Grains	0.816	0.188	0.075	0.065	1.916
2	Other agricultural products	0.741	0.272	0.106	0.092	2.064
3	Forestry products	0.718	0.386	0.053	0.049	1.561
4	Fish and seafood and hunting and trapping products	0.734	0.434	0.132	0.115	1.357
5	Metal ores and concentrates	0.815	0.301	0.036	0.030	1.211
6	Mineral fuels	0.898	0.184	0.020	0.018	1.282
7	Non-metallic minerals	0.833	0.300	0.038	0.032	1.406
8	Services incidental to mining	0.780	0.536	0.060	0.052	1.353
9	Meat, fish and dairy products	0.531	0.274	0.083	0.077	2.247
10	Fruit, vegetable and other food products and feeds	0.667	0.282	0.054	0.052	1.588
11	Soft drinks and alcoholic beverages	0.680	0.398	0.111	0.095	1.461
12	Tobacco and tobacco products	0.000	0.000	0.000	0.000	0.000
13	Leather, rubber, and plastic products	0.610	0.371	0.058	0.055	1.635
14	Textile products	0.664	0.353	0.069	0.061	1.789
15	Hosiery, clothing and accessories	0.554	0.518	0.098	0.086	1.235
16	Lumber and wood products	0.692	0.414	0.063	0.056	1.653
17	Furniture, mattresses and lamps	0.614	0.498	0.077	0.068	1.442
18	Wood pulp, paper and paper products	0.610	0.320	0.040	0.037	1.524
19	Printing and publishing	0.754	0.411	0.066	0.060	1.285
20	Primary metal products	0.367	0.217	0.029	0.026	1.303
21	Fabricated metal products	0.598	0.398	0.054	0.051	1.302
22	Machinery	0.631	0.317	0.040	0.038	1.315
23	Motor vehicles, other transportation equipment and parts	0.536	0.403	0.057	0.050	1.301
24	Electrical, electronic and communication products	0.365	0.334	0.050	0.047	1.347
25	Non-metallic mineral products	0.756	0.366	0.054	0.050	1.579
26	Petroleum and coal products	0.854	0.190	0.022	0.019	1.818
27	Chemicals, pharmaceuticals and chemical products	0.719	0.248	0.033	0.029	2.107
28	Miscellaneous manufactured products	0.666	0.413	0.070	0.066	1.374
29	Residential building construction	0.609	0.436	0.067	0.059	1.488
30	Non-residential construction	0.684	0.505	0.069	0.057	1.630
31	Repair construction	0.712	0.552	0.088	0.076	1.400
32	Transportation and storage	0.837	0.489	0.078	0.069	1.476
33	Communications services	0.850	0.371	0.061	0.053	1.265
34	Other utilities	0.917	0.276	0.036	0.031	1.392
35	Wholesaling margins	0.832	0.512	0.081	0.072	1.444
36	Retailing margins and services	0.857	0.610	0.158	0.140	1.414
38	Finance, insurance, and real estate services	0.844	0.471	0.068	0.061	1.499
39	Business and computer services	0.830	0.597	0.099	0.087	1.381
40	Private education services	0.889	0.747	0.166	0.145	1.296
41	Health care and social assistance services	0.869	0.655	0.128	0.106	1.257
42	Accommodation services and meals	0.723	0.491	0.160	0.132	1.460
43	Miscellaneous services	0.820	0.544	0.144	0.125	1.403
47	Non-market services provided by non-profit institutions serving households	0.863	0.727	0.179	0.150	1.335
48	Non-market government sector services	0.840	0.665	0.110	0.094	1.436

Notes: Intensity ratios for GDP, Labour Income and Gross Output expressed as total impact per dollar of output change
Intensity ratios for employment expressed as total number of jobs required per $10,000 of output change

TABLE 5: ALBERTA INDUSTRY INTENSITY RATIOS

(Closed Model – Direct , Indirect and Induced Impacts)

Industry		GDP at Basic Prices	Labour Income	Employment 2006	Employment 2009	Gross Output
11A	Crop and animal production	0.869	0.304	0.114	0.099	2.295
113	Forestry and logging	0.912	0.502	0.075	0.069	1.911
114	Fishing, hunting and trapping	1.107	0.828	0.251	0.218	1.917
115	Support activities for agriculture and forestry	1.073	0.716	0.165	0.149	1.949
211	Oil and gas extraction	0.988	0.234	0.030	0.026	1.432
212	Mining (except oil and gas extraction)	0.995	0.402	0.052	0.045	1.629
213	Support activities for mining and oil and gas extraction	1.038	0.685	0.089	0.077	1.784
22A	Electric power generation, transmission and distribution	0.969	0.267	0.033	0.029	1.501
22B	Natural gas distribution, water, sewage and other systems	1.291	0.370	0.057	0.049	1.872
230	Construction	0.915	0.532	0.097	0.082	1.990
311	Food manufacturing	0.711	0.353	0.090	0.082	2.304
312	Beverage and tobacco product manufacturing	0.738	0.348	0.055	0.051	1.687
31A	Textile and textile product mills	0.842	0.553	0.109	0.095	1.692
315	Clothing manufacturing	0.852	0.677	0.155	0.134	1.668
316	Leather and allied product manufacturing	0.847	0.419	0.176	0.166	1.632
321	Wood product manufacturing	0.895	0.529	0.084	0.074	2.011
322	Paper manufacturing	0.758	0.404	0.056	0.051	1.766
323	Printing and related support activities	0.852	0.535	0.085	0.074	1.669
324	Petroleum and coal products manufacturing	0.922	0.246	0.033	0.029	2.276
325	Chemical manufacturing	0.839	0.320	0.045	0.040	2.308
326	Plastics and rubber products manufacturing	0.790	0.480	0.079	0.074	1.942
327	Non-metallic mineral product manufacturing	0.938	0.467	0.074	0.067	1.873
331	Primary metal manufacturing	0.406	0.225	0.035	0.030	1.442
332	Fabricated metal products manufacturing	0.814	0.533	0.081	0.074	1.642
333	Machinery manufacturing	0.731	0.430	0.060	0.056	1.592
334	Computer and electronic product manufacturing	0.525	0.404	0.060	0.056	1.619
335	Electrical equipment, appliance and component manufacturing	0.754	0.580	0.100	0.094	1.661
336	Transportation equipment manufacturing	0.705	0.506	0.076	0.065	1.615
337	Furniture and related product manufacturing	0.879	0.630	0.106	0.093	1.842
339	Miscellaneous manufacturing	0.917	0.578	0.122	0.110	1.700
410	Wholesale trade	1.093	0.664	0.110	0.097	1.865
4A0	Retail trade	1.186	0.806	0.198	0.176	1.963
484	Truck transportation	1.119	0.738	0.120	0.107	2.011
485	Transit and ground passenger transportation	1.376	0.952	0.199	0.166	2.232
486	Pipeline transportation	1.050	0.291	0.039	0.033	1.404
48A	Air, Rail, Water & Scenic & Sightseeing Transportation & Support Activities for Transportation	0.987	0.587	0.092	0.080	1.933
49A	Postal service and couriers and messengers	1.207	0.876	0.179	0.162	2.047
493	Warehousing and storage	1.260	0.801	0.157	0.134	1.778
512	Motion picture and sound recording industries	0.899	0.372	0.078	0.067	1.592
513	Broadcasting and telecommunications	0.998	0.386	0.061	0.051	1.477
51A	Publishing industries, information services and data processing services	1.076	0.507	0.099	0.087	1.672
5A0	Finance, insurance, real estate and rental and leasing	1.105	0.566	0.073	0.065	1.770
541	Professional, scientific and technical services	1.137	0.809	0.136	0.119	1.905
561	Administrative and support services	1.209	0.809	0.192	0.168	1.926
562	Waste management and remediation services	1.092	0.417	0.069	0.060	1.539
610	Educational services	1.374	1.027	0.320	0.279	2.080
620	Health care and social assistance	1.215	0.833	0.163	0.135	1.800
710	Arts, entertainment and recreation	1.076	0.732	0.242	0.207	1.983
720	Accommodation and food services	0.985	0.643	0.188	0.157	1.892
811	Repair and maintenance	1.168	0.790	0.195	0.162	1.929
813	Grant-making, civic, and professional and similar organizations	1.214	0.924	0.200	0.171	1.935
81A	Personal and laundry services and private households	1.223	0.840	0.322	0.283	1.843
NP1	Non-profit institutions serving households (excluding education)	1.223	0.929	0.217	0.184	1.967
NP2	Non-profit education services	1.236	0.969	0.204	0.174	1.863
GS1	Hospitals and government nursing and residential care facilities	1.195	0.926	0.168	0.141	1.824
GS2	Universities and government education services	1.330	1.044	0.174	0.153	1.882
GS4	Other municipal government services	1.173	0.752	0.127	0.106	1.832
GS5	Other provincial and territorial government services	1.073	0.734	0.134	0.114	2.254
GS6	Other federal government services	1.119	0.840	0.131	0.113	1.906

Notes: Intensity ratios for GDP, Labour Income and Gross Output expressed as total impact per dollar of output change
Intensity ratios for employment expressed as total number of jobs required per $10,000 of output change

TABLE 6: ALBERTA INDUSTRY MULTIPLIERS

(Closed Model – Direct , Indirect and Induced Impacts)

Industry		GDP at Basic Prices	Labour Income	Employment 2006	Employment 2009	Gross Output
11A	Crop and animal production	3.134	8.137	2.147	2.158	2.295
113	Forestry and logging	2.092	2.181	2.732	2.618	1.911
114	Fishing, hunting and trapping	1.914	1.614	1.307	1.309	1.917
115	Support activities for agriculture and forestry	1.971	1.689	1.491	1.466	1.949
211	Oil and gas extraction	1.347	2.663	4.370	4.535	1.432
212	Mining (except oil and gas extraction)	1.545	1.850	2.567	2.674	1.629
213	Support activities for mining and oil and gas extraction	1.739	1.551	2.004	2.016	1.784
22A	Electric power generation, transmission and distribution	1.468	1.994	2.841	2.913	1.501
22B	Natural gas distribution, water, sewage and other systems	1.711	2.646	2.906	2.956	1.672
230	Construction	2.494	2.134	2.318	2.435	1.990
311	Food manufacturing	3.475	2.933	4.183	3.663	2.304
312	Beverage and tobacco product manufacturing	1.927	2.467	3.092	2.787	1.687
31A	Textile and textile product mills	1.831	1.639	1.590	1.595	1.692
315	Clothing manufacturing	1.854	1.506	1.395	1.398	1.668
316	Leather and allied product manufacturing	1.621	1.807	1.261	1.239	1.632
321	Wood product manufacturing	2.386	2.245	2.529	2.545	2.011
322	Paper manufacturing	2.126	2.121	2.935	2.768	1.766
323	Printing and related support activities	1.780	1.655	1.824	1.840	1.669
324	Petroleum and coal products manufacturing	14.416	10.459	14.324	13.231	2.276
325	Chemical manufacturing	5.028	4.558	7.058	6.490	2.308
326	Plastics and rubber products manufacturing	2.236	1.890	1.982	1.865	1.942
327	Non-metallic mineral product manufacturing	2.095	2.063	2.294	2.201	1.873
331	Primary metal manufacturing	2.244	2.311	2.765	2.829	1.442
332	Fabricated metal products manufacturing	1.781	1.639	1.849	1.790	1.642
333	Machinery manufacturing	1.779	1.756	2.138	2.019	1.592
334	Computer and electronic product manufacturing	2.997	2.171	2.852	2.596	1.619
335	Electrical equipment, appliance and component manufacturing	2.025	1.652	1.727	1.637	1.661
336	Transportation equipment manufacturing	1.932	1.674	1.951	1.971	1.615
337	Furniture and related product manufacturing	2.104	1.734	1.853	1.855	1.842
339	Miscellaneous manufacturing	1.754	1.649	1.525	1.507	1.700
410	Wholesale trade	1.848	1.764	1.952	1.931	1.865
4A0	Retail trade	1.901	1.658	1.437	1.427	1.963
484	Truck transportation	1.902	1.736	1.883	1.853	2.011
485	Transit and ground passenger transportation	2.014	1.663	1.566	1.606	2.232
486	Pipeline transportation	1.296	1.839	2.488	2.517	1.404
48A	Air, Rail, Water & Scenic & Sightseeing Transportation & Support Activities for Transportation	2.059	1.899	2.204	2.188	1.933
49A	Postal service and couriers and messengers	1.992	1.673	1.610	1.576	2.047
493	Warehousing and storage	1.577	1.423	1.470	1.479	1.776
512	Motion picture and sound recording industries	1.631	2.046	1.872	1.875	1.592
513	Broadcasting and telecommunications	1.390	1.706	1.959	2.033	1.477
51A	Publishing industries, information services and data processing service	1.585	1.622	1.761	1.747	1.672
5A0	Finance, insurance, real estate and rental and leasing	1.674	1.870	2.939	2.846	1.770
541	Professional, scientific and technical services	1.882	1.649	1.774	1.767	1.905
561	Administrative and support services	1.822	1.535	1.453	1.450	1.926
562	Waste management and remediation services	1.385	1.689	1.908	1.903	1.539
610	Educational services	1.893	1.528	1.267	1.266	2.080
620	Health care and social assistance	1.642	1.477	1.468	1.495	1.800
710	Arts, entertainment and recreation	2.136	1.858	1.404	1.413	1.983
720	Accommodation and food services	1.974	1.735	1.396	1.424	1.892
811	Repair and maintenance	1.867	1.631	1.421	1.450	1.929
813	Grant-making, civic, and professional and similar organizations	1.838	1.535	1.462	1.471	1.935
81A	Personal and laundry services and private households	1.688	1.510	1.205	1.202	1.843
NP1	Non-profit institutions serving households (excluding education)	1.896	1.509	1.383	1.394	1.967
NP2	Non-profit education services	1.723	1.403	1.353	1.362	1.863
GS1	Hospitals and government nursing and residential care facilities	1.692	1.452	1.507	1.525	1.824
GS2	Universities and government education services	1.649	1.404	1.520	1.505	1.882
GS4	Other municipal government services	1.721	1.590	1.724	1.774	1.832
GS5	Other provincial and territorial government services	3.688	3.481	4.117	4.153	2.254
GS6	Other federal government services	1.911	1.624	1.879	1.889	1.906

Notes: Multipliers for GDP expressed as total impact per direct change in GDP
Multipliers for Labour Income expressed as total impact per direct change in Labour Income
Multipliers for Gross Output expressed as total impact per direct change in Gross Output
Multipliers for Employment expressed as total jobs required per direct job required

You must know the direct change in GDP at basic prices, labour income or number of direct jobs required before using these multipliers.

TABLE 7: ALBERTA COMMODITY INTENSITY RATIOS IN PRODUCER PRICES

(Closed Model – Direct, Indirect and Induced Impacts)

Commodity		GDP at Basic Prices	Labour Income	Employment 2006	Employment 2009	Gross Output
1	Grains	1.423	0.377	0.133	0.116	3.248
2	Other agricultural products	0.977	0.391	0.135	0.117	2.550
3	Forestry products	1.068	0.582	0.087	0.080	2.231
4	Fish and seafood and hunting and trapping products	1.347	0.791	0.220	0.191	2.431
5	Metal ores and concentrates	1.099	0.445	0.061	0.052	1.668
6	Mineral fuels	1.194	0.285	0.037	0.032	1.731
7	Non-metallic minerals	1.450	0.569	0.080	0.069	2.442
8	Services incidental to mining	1.038	0.684	0.089	0.077	1.784
9	Meat, fish and dairy products	0.815	0.430	0.120	0.109	3.009
10	Fruit, vegetable and other food products and feeds	1.014	0.455	0.087	0.082	2.288
11	Soft drinks and alcoholic beverages	1.143	0.665	0.173	0.148	2.327
12	Tobacco and tobacco products	0.000	0.000	0.000	0.000	0.000
13	Leather, rubber, and plastic products	0.998	0.598	0.099	0.092	2.440
14	Textile products	1.193	0.644	0.126	0.111	2.952
15	Hosiery, clothing and accessories	1.092	0.891	0.171	0.148	2.234
16	Lumber and wood products	1.662	0.985	0.160	0.141	3.693
17	Furniture, mattresses and lamps	1.044	0.775	0.127	0.112	2.248
18	Wood pulp, paper and paper products	1.019	0.545	0.077	0.069	2.370
19	Printing and publishing	1.067	0.588	0.099	0.089	1.812
20	Primary metal products	0.578	0.340	0.051	0.044	1.806
21	Fabricated metal products	1.000	0.642	0.096	0.086	2.050
22	Machinery	1.138	0.588	0.083	0.077	2.281
23	Motor vehicles, other transportation equipment and parts	0.950	0.659	0.103	0.090	2.110
24	Electrical, electronic and communication products	0.618	0.498	0.079	0.074	1.889
25	Non-metallic mineral products	1.208	0.606	0.096	0.087	2.426
26	Petroleum and coal products	1.628	0.418	0.055	0.048	3.393
27	Chemicals, pharmaceuticals and chemical products	1.079	0.408	0.060	0.053	2.966
28	Miscellaneous manufactured products	1.146	0.698	0.123	0.113	2.258
29	Residential building construction	0.833	0.565	0.092	0.080	1.862
30	Non-residential construction	0.930	0.646	0.097	0.081	2.042
31	Repair construction	1.040	0.747	0.125	0.108	1.960
32	Transportation and storage	1.087	0.633	0.106	0.093	1.894
33	Communications services	1.073	0.495	0.085	0.074	1.632
34	Other utilities	1.067	0.359	0.052	0.045	1.642
35	Wholesaling margins	1.082	0.655	0.109	0.096	1.861
36	Retailing margins and services	1.178	0.794	0.194	0.171	1.952
38	Finance, insurance, and real estate services	1.090	0.612	0.095	0.085	1.911
39	Business and computer services	1.147	0.780	0.134	0.118	1.910
40	Private education services	1.280	0.971	0.210	0.183	1.949
41	Health care and social assistance services	1.213	0.852	0.166	0.139	1.832
42	Accommodation services and meals	0.988	0.643	0.190	0.158	1.904
43	Miscellaneous services	1.120	0.716	0.179	0.155	1.905
47	Non-market services provided by non-profit institutions serving households	1.231	0.937	0.220	0.186	1.950
48	Non-market government sector services	1.176	0.858	0.148	0.127	1.997

Notes: Intensity ratios for GDP, Labour Income and Gross Output expressed as total impact per dollar of output change
Intensity ratios for employment expressed as total number of jobs required per $10,000 of output change

TABLE 8: ALBERTA COMMODITY INTENSITY RATIOS IN PURCHASER PRICES

(Closed Model – Direct, Indirect and Induced Impacts)

Commodity		GDP at Basic Prices	Labour Income	Employment 2006	Employment 2009	Gross Output
1	Grains	0.906	0.240	0.085	0.074	2.067
2	Other agricultural products	0.881	0.352	0.121	0.106	2.298
3	Forestry products	0.914	0.498	0.075	0.068	1.908
4	Fish and seafood and hunting and trapping products	0.978	0.574	0.160	0.138	1.765
5	Metal ores and concentrates	0.988	0.400	0.055	0.047	1.500
6	Mineral fuels	0.989	0.236	0.031	0.026	1.433
7	Non-metallic minerals	0.981	0.385	0.054	0.046	1.652
8	Services incidental to mining	1.038	0.684	0.089	0.077	1.784
9	Meat, fish and dairy products	0.672	0.355	0.099	0.090	2.483
10	Fruit, vegetable and other food products and feeds	0.809	0.363	0.070	0.065	1.826
11	Soft drinks and alcoholic beverages	0.888	0.517	0.134	0.115	1.809
12	Tobacco and tobacco products	0.000	0.000	0.000	0.000	0.000
13	Leather, rubber, and plastic products	0.795	0.477	0.079	0.073	1.945
14	Textile products	0.844	0.456	0.089	0.079	2.090
15	Hosiery, clothing and accessories	0.624	0.672	0.129	0.112	1.686
16	Lumber and wood products	0.902	0.535	0.087	0.076	2.004
17	Furniture, mattresses and lamps	0.863	0.640	0.105	0.092	1.857
18	Wood pulp, paper and paper products	0.770	0.412	0.058	0.052	1.791
19	Printing and publishing	0.959	0.528	0.089	0.080	1.628
20	Primary metal products	0.475	0.279	0.042	0.037	1.484
21	Fabricated metal products	0.796	0.511	0.076	0.070	1.632
22	Machinery	0.786	0.406	0.058	0.053	1.576
23	Motor vehicles, other transportation equipment and parts	0.737	0.519	0.080	0.070	1.637
24	Electrical, electronic and communication products	0.531	0.429	0.068	0.063	1.625
25	Non-metallic mineral products	0.937	0.470	0.075	0.068	1.882
26	Petroleum and coal products	0.947	0.243	0.032	0.028	1.974
27	Chemicals, pharmaceuticals and chemical products	0.841	0.318	0.046	0.041	2.311
28	Miscellaneous manufactured products	0.675	0.533	0.094	0.086	1.724
29	Residential building construction	0.833	0.565	0.092	0.080	1.862
30	Non-residential construction	0.930	0.646	0.097	0.081	2.042
31	Repair construction	0.986	0.708	0.119	0.103	1.857
32	Transportation and storage	1.085	0.631	0.106	0.093	1.890
33	Communications services	1.038	0.479	0.083	0.071	1.580
34	Other utilities	1.054	0.355	0.051	0.044	1.621
35	Wholesaling margins	1.082	0.655	0.109	0.096	1.861
36	Retailing margins and services	1.178	0.794	0.194	0.171	1.952
38	Finance, insurance, and real estate services	1.077	0.605	0.094	0.084	1.890
39	Business and computer services	1.129	0.768	0.132	0.116	1.880
40	Private education services	1.280	0.971	0.210	0.183	1.949
41	Health care and social assistance services	1.213	0.851	0.166	0.139	1.831
42	Accommodation services and meals	0.984	0.641	0.189	0.158	1.897
43	Miscellaneous services	1.103	0.706	0.176	0.152	1.877
47	Non-market services provided by non-profit institutions serving households	1.231	0.937	0.220	0.186	1.950
48	Non-market government sector services	1.176	0.858	0.148	0.127	1.997

Notes: Intensity ratios for GDP, Labour Income and Gross Output expressed as total impact per dollar of output change
Intensity ratios for employment expressed as total number of jobs required per $10,000 of output change

TABLE 9: ALBERTA COMMODITY SUPPLY RATIOS

(Percent)

Commodity		Alberta	Rest of Canada	Rest of World	Total Supply
1	Grains	87.6	9.9	2.5	100.0
2	Other agricultural products	73.2	22.7	4.1	100.0
3	Forestry products	69.5	30.2	0.3	100.0
4	Fish, seafood and trapping products	8.0	37.0	55.0	100.0
5	Metal ores & concentrates	0.0	0.0	100.0	100.0
6	Mineral fuels	88.1	11.8	0.1	100.0
7	Non-metallic minerals	62.8	22.4	14.8	100.0
8	Services incidental to mining	97.6	2.3	0.1	100.0
9	Meat, fish, and dairy products	41.9	53.6	4.5	100.0
10	Fruit, veg. and other food products, feeds	20.4	47.8	31.8	100.0
11	Soft drinks and alcoholic beverages	56.2	21.7	22.1	100.0
12	Tobacco and tobacco products	0.0	62.4	37.6	100.0
13	Leather, rubber, and plastic products	23.6	27.5	48.9	100.0
14	Textile products	9.8	27.0	63.2	100.0
15	Hosiery, clothing and accessories	1.5	13.4	85.1	100.0
16	Lumber and wood products	49.9	41.2	8.9	100.0
17	Furniture and fixtures	31.1	30.8	38.1	100.0
18	Wood pulp, paper and paper products	22.1	45.1	32.8	100.0
19	Printing and publishing	48.6	30.3	21.1	100.0
20	Primary metal products	23.1	21.4	55.5	100.0
21	Other metal products	34.1	20.2	45.7	100.0
22	Machinery and equipment	29.7	4.6	65.7	100.0
23	Motor veh., oth. transport equip. and parts	4.1	20.6	75.3	100.0
24	Electrical, electronic and communic. prod.	5.1	10.8	84.1	100.0
25	Non-metallic mineral products	61.4	13.6	25.0	100.0
26	Petroleum and coal products	81.6	9.0	9.4	100.0
27	Chemicals, pharmaceuticals & chemical prod.	50.6	15.1	34.3	100.0
28	Other manufactured products	19.4	17.6	63.0	100.0
29	Residential construction	100.0	0.0	0.0	100.0
30	Non-residential construction	100.0	0.0	0.0	100.0
31	Repair construction	100.0	0.0	0.0	100.0
32	Transportation and storage	79.6	17.3	3.1	100.0
33	Communications services	68.5	24.7	6.8	100.0
34	Other utilities	99.0	0.9	0.1	100.0
35	Wholesaling margins	73.3	26.4	0.3	100.0
36	Retailing margins	96.1	3.9	0.0	100.0
38	Other finance, insurance, and real estate services	81.2	14.5	4.3	100.0
39	Business and computer services	72.7	19.5	7.8	100.0
40	Private education services	90.2	4.7	5.1	100.0
41	Health and social services	98.9	0.8	0.3	100.0
42	Accommodation services and meals	95.1	4.7	0.2	100.0
43	Other services	88.4	7.7	3.9	100.0
44	Transportation margins	65.0	35.0	0.0	100.0

APPENDIX 1

Industry Aggregation Parameters

Industry	Worksheet Level Number	Link Level Number
11A Crop & Animal Production	111400-112A00	111, 112
113 Forestry & Logging	113000	113
114 Fishing, Hunting & Trapping	114000	114
115 Support Activities for Agriculture & Forestry	115100-115300	115
211 Oil & Gas Extraction	211100	2111
212 Mining (Except Oil & Gas Extraction)	212100-21239A	2121, 2122, 2123
213 Support Activities for Mining & Oil & Gas Extraction	213100	2131
22A Electric Power Generation, Transmission & Dist'n	221100	2211
22B Natural Gas Dist'n, Water, Sewage & Other Systems	221200-221300	2212, 2213
230 Construction	2300A0-2300I0	23
311 Food Manufacturing	311100-3119A0	311
312 Beverage & Tobacco Products Manufacturing	312110-312200	312
31A Textile, 315 Clothing & 316 Leather Industries	313100-316900	313, 314, 315, 316
321 Wood Product Manufacturing	321100-321990	321
322 Paper Manufacturing	322110-322290	322
323 Printing & Related Support Activities	323110-323120	323
324 Petroleum & Coal Products Manufacturing	324110-324190	324
325 Chemical Manufacturing	325110-325900	325
326 Plastics & Rubber Products Manufacturing	326110-326290	326
327 Non-Metallic Mineral Products Manufacturing	327310-327900	327
331 Primary Metal Manufacturing	331100-331520	331
332 Fabricated Metal Products Manufacturing	332100-332900	332
333 Machinery Manufacturing & 336 Transportation Equip.	333110-333990, 336110-336900	333, 336
334 Computer & Electronic Products Manufacturing	334100-334600	334
335 Electrical Equip., Appliance & Component Manufacturing	335200-3359A0	335
337 Furniture & Related Products Manufacturing	337110-337900	337
339 Miscellaneous Manufacturing	339100-339990	339
410 Wholesale Trade	410000	41
4A0 Retail Trade	4A0000	44-45
484 Truck Transportation	484000	484
485 Transit & Ground Passenger Transportation	485100-485A00	485
486 Pipeline Transportation	486200-486A00	486
48A Air, Rail, Water & Scenic & Sightseeing Transportation	481000-483000, 487000-488000	481-483, 487, 488
49A Postal Service and Couriers & Messengers	491000-492000	491, 492
493 Warehousing & Storage	493130-4931A0	493
512 Motion Picture & Sound Recording Industries	512130-5122200	512
513 Broadcasting & Telecommunications	513100-513300	513
51A Publishing Industries, Information Services & Data Processing	511100-511200, 514100-514200	511, 514
5A0 Finance, Insurance, Real Estate and Renting & Leasing	5A0110-5A0650	521-523, 526, 531-533, 551
541 Professional, Scientific & Technical Services	541300-541B00	541
561 Administrative & Support Services	561500-561A00	561
562 Waste Management & Remediation Services	562000	562
610 Educational Services	611100-611B00	611
620 Health Care & Social Assistance	621110-624000	621, 623, 624
710 Arts, Entertainment & Recreation	711000-713A00	71
720 Accommodation & Food Services	721100-722000	72
811 Repair & Maintenance	811110-811A00	811
813 Grant Making, Civic & Professional & Similar Orgs.	813A00	8132-8134, 8139
81A Personal & Laundry Services & Private Households	812200-814000	812, 814
NP1 Non-Profit Institutions Serving Households (Excl. Education)	NP1100-NP1900	Fictive
NP2 Non-Profit Education Institutions	NP2000	Fictive
GS1 Hospitals & Residential Care Facilities	GS1100-GS1200	622
GS2 Education	GS2100-GS2230	6113
GS4 Other Municipal Government Services	GS4000	Fictive
GS5 Other Provincial Government Services	GS5000	Fictive
GS6 Other Federal Government Services	GS3000, GS6000	Fictive

APPENDIX 2

Industry Codes at the Worksheet Level (W) in Terms of 1997 NAICS

Code	Industry Title - W	1997 NAICS
111400	Greenhouse, Nursery and Floriculture Production	1114
111A00	Crop Production (except Greenhouse, Nursery and Floriculture Production)	1111-1113, 1119
112500	Animal Aquaculture	1125
112A00	Animal Production (except Animal Aquaculture)	1121-1124, 1129
113000	Forestry and Logging	113
114000	Fishing, Hunting and Trapping	114
115100	Support Activities for Crop Production	1151
115200	Support Activities for Animal Production	1152
115300	Support Activities for Forestry	1153
211100	Oil and Gas extraction	2111
212100	Coal Mining	2121
212210	Iron Ore Mining	21221
212220	Gold and Silver Ore Mining	21222
212230	Copper, Nickel, Lead and Zinc Ore Mining	21223
212290	Other Metal Ore Mining	21229
212310	Stone Mining and Quarrying	21231
212320	Sand, Gravel, Clay, & Ceramic & Refractory Minerals Mining & Quarrying	21232
212393	Salt Mining	212392
212394	Asbestos Mining	212393
212396	Potash Mining	212394
21239A	Miscellaneous Non-Metallic Mineral Mining and Quarrying	212396
213100	Support Activities for Mining and Oil and Gas Extraction	2131
221100	Electric Power Generation, Transmission and Distribution	2211
221200	Natural Gas Distribution	2212
221300	Water, Sewage and Other Systems	2213
2300A0	Residential Building Construction	231210
2300B0	Non-residential Building Construction	231220
2300C0	Transportation Engineering Construction	231310
2300D0	Oil and Gas Engineering Construction	231330
2300E0	Electric Power Engineering Construction	23
2300F0	Communication Engineering Construction	23
2300G0	Other Engineering Construction	23
2300H0	Repair Construction	23
2300I0	Other Activities of the Construction Industry	23
311100	Animal Food Manufacturing	3111
311210	Flour Milling and Malt Manufacturing	31121
311220	Starch and Vegetable Fat and Oil Manufacturing	31122
311230	Breakfast Cereal Manufacturing	31123
311310	Sugar Manufacturing	31131
3113A0	Confectionery Product Manufacturing	31131
311410	Frozen Food Manufacturing	31141
311420	Fruit and Vegetable Canning, Pickling and Drying	31142
311500	Dairy Product Manufacturing	3115
311611	Animal (except Poultry) Slaughtering	311611
311614	Rendering and Meat Processing from Carcasses	311614
311615	Poultry Processing	311615
311700	Seafood Product Preparation and Packaging	3117
311810	Bread and Bakery Product Manufacturing	31181
311821	Cookie and Cracker Manufacturing	311821
311822	Flour Mixes and Dough Manufacturing from Purchased Flour	311822
31182A	Dry Pasta and Tortilla Manufacturing	311823, 31183
311910	Snack Food Manufacturing	31191
311920	Coffee and Tea Manufacturing	31192

APPENDIX 2: Industry Codes at the Worksheet Level (W) in Terms of 1997 NAICS cont'd

Code	Industry Title - W	1997 NAICS
3119A0	Other Miscellaneous Food Manufacturing	31193, 31194, 31199
312110	Soft Drink and Ice Manufacturing	31211
312120	Breweries	31212
312130	Wineries	31213
312140	Distilleries	31214
312200	Tobacco Manufacturing	3122
313100	Fibre, Yarn and Thread Mills	3131
313200	Fabric Mills	3132
313300	Textile and Fabric Finishing and Fabric Coating	3133
314110	Carpet and Rug Mills	31411
314120	Curtain and Linen Mills	31412
314910	Textile Bag and Canvas Mills	31491
314990	All Other Textile Product Mills	31499
315110	Hosiery and Sock Mills	31511
315190	Other Clothing Knitting Mills	31519
315210	Cut and Sew Clothing Contracting	31521
315220	Men's and Boys' Cut and Sew Clothing Manufacturing	31522
315230	Women's and Girls' Cut and Sew Clothing Manufacturing	31523
315290	Other Cut and Sew Clothing Manufacturing	31529
315900	Clothing Accessories and Other Clothing Manufacturing	3159
316100	Leather and Hide Tanning and Finishing	3161
316200	Footwear Manufacturing	3162
316900	Other Leather and Allied Product Manufacturing	3169
321100	Sawmills and Wood Preservation	3211
321215	Structural Wood Product Manufacturing	321215
32121A	Veneer and Plywood Mills	321211, 321212
32121B	Particle Board, Fibreboard, and Waferboard Mills	321216, 321217
321911	Wood Window and Door Manufacturing	321911
321919	Other Millwork	321919
321920	Wood Container and Pallet Manufacturing	32192
321990	All Other Wood Product Manufacturing	32199
322110	Pulp Mills	32211
322121	Paper (except Newsprint) Mills	322121
322122	Newsprint Mills	322122
322130	Paperboard Mills	32213
322210	Paperboard Container Manufacturing	32221
322220	Paper Bag and Coated and Treated Paper Manufacturing	32222
322230	Stationery Product Manufacturing	32223
322290	Other Converted Paper Product Manufacturing	32229
323110	Printing	32311
323120	Support Activities for Printing	32312
324110	Petroleum Refineries	32411
324120	Asphalt Paving, Roofing and Saturated Materials Manufacturing	32412
324190	Other Petroleum and Coal Products Manufacturing	32419
325110	Petrochemical Manufacturing	32511
325120	Industrial Gas Manufacturing	32512
325130	Synthetic Dye and Pigment Manufacturing	32513
3251A0	Other Basic Chemical Manufacturing	32518, 32519
325200	Resin, Synthetic Rubber, & Artificial & Synthetic Fibres & Filaments Man.	3252
325310	Fertilizer Manufacturing	32531
325320	Pesticide and Other Agricultural Chemical Manufacturing	32532
325400	Pharmaceutical and Medicine Manufacturing	3254
325510	Paint and Coating Manufacturing	32551

APPENDIX 2: Industry Codes at the Worksheet Level (W) in Terms of 1997 NAICS cont'd

Code	INDUSTRY TITLE - W	1997 NAICS
325520	Adhesive Manufacturing	32552
325610	Soap and Cleaning Compound Manufacturing	32561
325620	Toilet Preparation Manufacturing	32562
325900	Other Chemical Product Manufacturing	3259
326110	Unsupported Plastic Film, Sheet and Bag Manufacturing	32611
326120	Plastic Pipe, Pipe Fitting and Unsupported Profile Shape Manufacturing	32612
326130	Laminated Plastic Plate, Sheet and Shape Manufacturing	32613
326160	Plastic Bottle Manufacturing	32616
3261A0	Polystyrene, Urethane and Other Foam Product Manufacturing	32614, 32615
326193	Motor Vehicle Plastic Parts Manufacturing	326193
32619A	Miscellaneous Plastic Product Manufacturing	326191, 326198
326210	Tire Manufacturing	32621
326220	Rubber and Plastic Hose and Belting Manufacturing	32622
326290	Other Rubber Product Manufacturing	32629
327100	Clay Product and Refractory Manufacturing	3271
327200	Glass and Glass Product Manufacturing	3272
327310	Cement Manufacturing	32731
327320	Ready-Mix Concrete Manufacturing	32732
3273A0	Concrete Product Manufacturing	32733, 32739
327400	Lime and Gypsum Product Manufacturing	3274
327900	Other Non-Metallic Mineral Product Manufacturing	3279
331100	Iron and Steel Mills and Ferro-Alloy Manufacturing	3311
331210	Iron and Steel Pipes and Tubes Manufacturing from Purchased Steel	33121
331220	Rolling and Drawing of Purchased Steel	33122
331313	Primary Production of Alumina and Aluminum	331313
331317	Aluminum Rolling, Drawing, Extruding and Alloying	331317
331410	Non-Ferrous Metal (except Aluminum) Smelting and Refining	33141
3314A0	Non-Ferrous Metal (except Aluminum) Rolling, Drawing, Extruding and All	33142, 33149
331510	Ferrous Metal Foundries	33151
331520	Non-Ferrous Metal Foundries	33152
332100	Forging and Stamping	3321
332200	Cutlery and Hand Tool Manufacturing	3322
332311	Prefabricated Metal Building and Component Manufacturing	332311
33231A	All Other Plate Work and Fabricated Structural Product Manufacturing	332314, 332319
332320	Ornamental and Architectural Metal Products Manufacturing	33232
332410	Power Boiler and Heat Exchanger Manufacturing	33241
332420	Metal Tank (Heavy Gauge) Manufacturing	33242
332430	Metal Can, Box and Other Metal Container (Light Gauge) Manufacturing	33243
332500	Hardware Manufacturing	3325
332600	Spring and Wire Product Manufacturing	3326
332710	Machine Shops	33271
332720	Turned Product and Screw, Nut and Bolt Manufacturing	33272
332800	Coating, Engraving, Heat Treating and Allied Activities	3328
332900	Other Fabricated Metal Product Manufacturing	3329
333110	Agricultural Implement Manufacturing	33311
333120	Construction Machinery Manufacturing	33312
333130	Mining and Oil and Gas Field Machinery Manufacturing	33313
333200	Industrial Machinery Manufacturing	3332
333300	Commercial and Service Industry Machinery Manufacturing	3333
333400	Ventilation, Heating, Air-Conditioning and Commercial Refrigeration Equip	3334
333500	Metalworking Machinery Manufacturing	3335
333600	Engine, Turbine and Power Transmission Equipment Manufacturing	3336
333910	Pump and Compressor Manufacturing	33391
333920	Material Handling Equipment Manufacturing	33392
333990	All Other General-Purpose Machinery Manufacturing	33399
334100	Computer and Peripheral Equipment Manufacturing	3341
334210	Telephone Apparatus Manufacturing	33421
334220	Radio & Television Broadcasting & Wireless Communications Equipment	33422
334290	Other Communications Equipment Manufacturing	33429
334300	Audio and Video Equipment Manufacturing	3343

APPENDIX 2: Industry Codes at the Worksheet Level (W) in Terms of 1997 NAICS cont'd

Code	INDUSTRY TITLE - W	1997 NAICS
334400	Semiconductor and Other Electronic Component Manufacturing	3344
334500	Navigational, Measuring, Medical and Control Instruments Manufacturing	3345
334600	Manufacturing and Reproducing Magnetic and Optical Media	3346
335100	Electric Lighting Equipment Manufacturing	3351
335200	Household Appliance Manufacturing	3352
335311	Power, Distribution and Specialty Transformers Manufacturing	335311
335312	Motor and Generator Manufacturing	335312
335315	Switchgear and Switchboard, and Relay and Industrial Control Apparatus	335315
335910	Battery Manufacturing	33591
335920	Communication and Energy Wire and Cable Manufacturing	33592
3359A0	Wiring Devices and All Other Electrical Equipment and Component Manufac	33593, 33599
336110	Automobile and Light-Duty Motor Vehicle Manufacturing	33611
336120	Heavy-Duty Truck Manufacturing	33612
336200	Motor Vehicle Body and Trailer Manufacturing	3362
336310	Motor Vehicle Gasoline Engine and Engine Parts Manufacturing	33631
336320	Motor Vehicle Electrical and Electronic Equipment Manufacturing	33632
336330	Motor Vehicle Steering and Suspension Components (except Spring) Manufacturing	33633
336340	Motor Vehicle Brake System Manufacturing	33634
336350	Motor Vehicle Transmission and Power Train Parts Manufacturing	33635
336360	Motor Vehicle Seating and Interior Trim Manufacturing	33636
336370	Motor Vehicle Metal Stamping	33637
336390	Other Motor Vehicle Parts Manufacturing	33639
336400	Aerospace Product and Parts Manufacturing	3364
336500	Railroad Rolling Stock Manufacturing	3365
336611	Ship Building and Repairing	336611
336612	Boat Building	336612
336900	Other Transportation Equipment Manufacturing	3369
337110	Wood Kitchen Cabinet and Counter Top Manufacturing	33711
337127	Institutional Furniture Manufacturing	337127
33712A	Household Furniture Manufacturing	337121, 337123, 337126
337200	Office Furniture (including Fixtures) Manufacturing	3372
337900	Other Furniture-Related Product Manufacturing	3379
339100	Medical Equipment and Supplies Manufacturing	3391
339910	Jewellery and Silverware Manufacturing	33991
339920	Sporting and Athletic Goods Manufacturing	33992
339930	Doll, Toy and Game Manufacturing	33993
339940	Office Supplies (except Paper) Manufacturing	33994
339950	Sign Manufacturing	33995
339990	All Other Miscellaneous Manufacturing	33999
410000	Wholesale Trade	41
4A0000	Retail Trade	44-45
481000	Air Transportation	481
482000	Rail Transportation	482
483000	Water Transportation	483
484000	Truck Transportation	484
485100	Urban Transit Systems	4851
485200	Interurban and Rural Bus Transportation	4852
485300	Taxi and Limousine Service	4853
485A00	All Other Transit and Ground Passenger Transportation	4854, 4855, 4859
486200	Pipeline Transportation of Natural Gas	4862
486A00	Crude Oil and Other Pipeline Transportation	4861, 4869
487000	Scenic and Sightseeing Transportation	487
488000	Support Activities for Transportation	488
491000	Postal Service	491
492000	Couriers and Messengers	492
493130	Farm Product Warehousing and Storage	49313

APPENDIX 2: Industry Codes at the Worksheet Level (W) in Terms of 1997 NAICS cont'd

Code	INDUSTRY TITLE - W	1997 NAICS
4931A0	All Other Warehousing and Storage	49311, 49312, 49319
511100	Newspaper, Periodical, Book and Database Publishers	5111
511200	Software Publishers	5112
512130	Motion Picture and Video Exhibition	51213
5121A0	Motion Picture & Video Production, Distribution, Post-Production & Other Motion Picture & Video Ind.	51211, 51212, 51219
512200	Sound Recording Industries	5122
513100	Radio and Television Broadcasting	5131
513200	Pay TV, Specialty TV and Program Distribution	5132
513300	Telecommunications	5133
514100	Information Services	5141
514200	Data Processing Services	5142
5A0110	Monetary Authorities - Central Bank	521
5A0120	Local Credit Unions	52213
5A0130	Banking and Other Depository Credit Intermediation	52211, 52219
5A0200	Insurance Carriers	5241
5A0300	Lessors of Real Estate	5311
5A0400	Owner-Occupied Dwellings	5311
5A0510	Automotive Equipment Rental and Leasing	5321
5A0520	Rental and leasing (except Automotive Equipment) and Lessors of Non-Financial Intangible Assets (except Copyrighted Works)	5322-5324, 533
5A0610	Non-Depository Credit Intermediation and Activities Related to Credit Intermediation	5222, 5223
5A0620	Agencies, Brokerages and Other Insurance Related Activities	5242
5A0630	Securities, Commodity Contracts, Funds, and Other Financial Investment	523, 526
5A0640	Offices of Real Estate Agents and Brokers and Activities Related to Real Estate	5312, 5313
5A0650	Management of Companies and Enterprises	551
541300	Architectural, Engineering and Related Services	5413
541500	Computer Systems Design and Related Services	5415
541800	Advertising and Related Services	5418
541A00	Legal, Accounting, Tax Preparation, Bookkeeping and Payroll Services	5411, 5412
541B00	Other Professional, Scientific and Technical Services	5414, 5416, 5417, 5419
561500	Travel Arrangement and Reservation Services	5615
561600	Investigation and Security Services	5616
561700	Services to Buildings and Dwellings	5617
561A00	Other Administrative and Support Services	5611-5614, 5619
562000	Waste Management and Remediation Services	562
611A00	Education and Educational Support Services (excluding non-profit and gov.)	61
621100	Offices of Physicians	6211
621200	Offices of Dentists	6212
621A00	Miscellaneous Ambulatory Health Care Services	6213-6216, 6219
623000	Nursing and Residential Care Facilities	623
624000	Social Assistance	624
711000	Performing Arts, Spectator Sports and Related Industries	711
712000	Heritage Institutions (excluding Government Funded)	712
713200	Gambling Industries	7132
713A00	Amusement and Recreation Industries	7131, 7139
721100	Traveller Accommodation	7211
721A00	RV (Recreational Vehicle) Parks, Recreational Camps, and Rooming & Boarding	7212, 7213
722000	Food Services and Drinking Places	722
811100	Automotive Repair and Maintenance	8111
811A00	Repair and Maintenance (except Automotive Repair and Maintenance)	8112-8114
812200	Funeral Services	8122
812300	Dry Cleaning and Laundry Services	8123

APPENDIX 2: Industry Codes at the Worksheet Level (W) in Terms of 1997 NAICS cont'd

Code	INDUSTRY TITLE - W	1997 NAICS
812A00	Personal Care Services and Other Personal Services	8121, 8129
813A00	Grant-Making, Civic, and Professional and Similar Organizations	8132-8134, 8139
814000	Private Households	814
F10100	Operating Supplies	Fictive
F10200	Office Supplies	Fictive
F10300	Cafeteria Supplies	Fictive
F10400	Laboratory Supplies	Fictive
F20100	Travel & Entertainment	Fictive
F20200	Advertising and Promotion	Fictive
F30000	Transportation Margins	Fictive
NP1100	Religious Organizations	8131
NP1200	Non-Profit Welfare Organizations	Fictive
NP1300	Non-Profit Sports and Recreation Clubs	Fictive
NP2000	Non-Profit Education Services	Fictive
NP1900	Other Non-Profit Institutions Serving Households	Fictive
GS1100	Hospitals	622
GS1200	Government Residential Care Facilities	Fictive
GS2100	Universities	6113
GS2210	Government Elementary and Secondary Schools	6111
GS2220	Government Community Colleges and C.E.G.E.P.s	6112
GS2230	Other Govt Education Services	Fictive
GS3000	Defence Services	9111
GS4000	Other Municipal Government Services	Fictive
GS5000	Other Provincial and Territorial Government Services	Fictive
GS6000	Other Federal Government Services	Fictive
GS7000	Other Aboriginal Government Services	Fictive